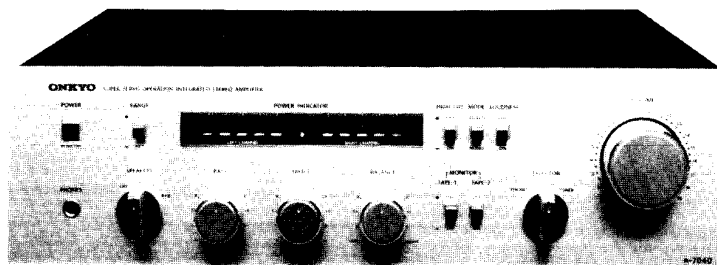


# ONKYO® SERVICE MANUAL

## SUPER SERVO OPERATION INTEGRATED STEREO AMPLIFIER MODEL A-7040



## SPECIFICATIONS

|                                  |                                                                                                                                           |                        |                                                                                        |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------|
| Power Output:                    | 50 watts per channel, min. RMS, at 8 ohms both channels driven, from 20 Hz to 20 kHz, with no more than 0.026% total harmonic distortion. | Signal to noise ratio: | PHONO: 80 dB (IHF A Network)<br>TUNER: 90 dB (IHF A Network)                           |
| Total Harmonic Distortion:       | 0.026% at rated power<br>0.02% at 1 watt output                                                                                           | Loudness: (-40 dB)     | +5 dB at 100 Hz<br>+5 dB at 10 kHz                                                     |
| IM Distortion:                   | 0.026% at rated power<br>0.02% at 1 watt output                                                                                           | Range (Ind. switch)    | x 1, x 0.1                                                                             |
| Frequency Response:              | 15 ~ 50,000 Hz ( $\pm 1$ dB)                                                                                                              | <b>GENERAL</b>         |                                                                                        |
| RIAA Deviation:                  | 20 ~ 20,000 Hz ( $\pm 0.5$ dB)                                                                                                            | Power Supply Rating:   | AC 120 volts, 60 Hz (120V model)<br>AC 110, 120, 220 or 240V 50/60Hz (Universal model) |
| Damping Factor:                  | 45 at 8 ohms                                                                                                                              | Outputs:               | SPEAKER A & B, PHONES<br>TAPE REC 1 & 2                                                |
| Input Sensitivity and Impedance: | PHONE 1 & 2: 2.5mV, 50 kohms<br>TUNER: 150mV, 50 kohms<br>TAPE PLAY 1 & 2: 150mV, 50 kohms                                                | Inputs:                | PHONO 1 & 2<br>TUNER<br>TAPE PLAY 1 & 2                                                |
| Phono Overload:                  | 170mV RMS. at 1kHz, 0.026% THD                                                                                                            | Semiconductors:        | 22 Transistors, 10 ICs, 19 Diodes                                                      |
| Tone Control                     |                                                                                                                                           | Dimensions:            | 418(W) x 124(H) x 396(D) mm<br>16-1/2" x 4-15/16" x 15-5/8"                            |
| BASS:                            | $\pm 10$ dB at 100 Hz                                                                                                                     | Weight:                | 9.4 kg (20.7 lbs)                                                                      |
| TREBLE:                          | $\pm 10$ dB at 10 kHz                                                                                                                     |                        |                                                                                        |
| High Cut Filter                  | 6 kHz (6 dB/oct.)                                                                                                                         |                        |                                                                                        |

Specifications and features are subject to change without notice for improvement.

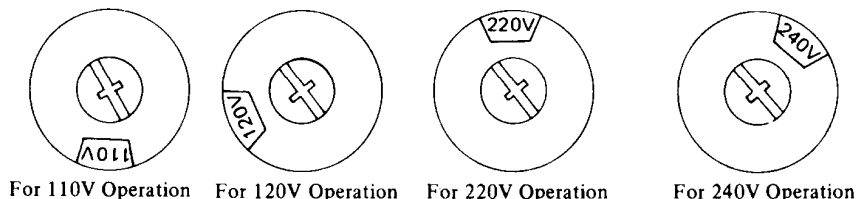
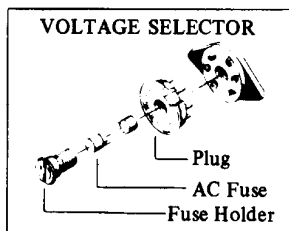
## SERVICE PROCEDURES

### 1. VOLTAGE CONVERSION (Universal model)

This model is equipped with a universal power transformer to permit operation at either power source of 110, 120, 220 or 240V AC 50/60Hz.

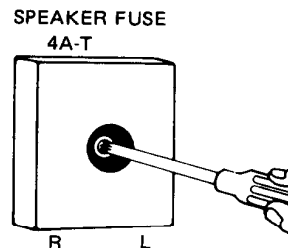
To convert the unit to a different power source voltage, change the plug as illustrated in the drawing below.

**CAUTION: DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE.**



### 2. REPLACING THE SPEAKER PROTECTION FUSE

- 1) Remove a screw holding the cover and back panel.
- 2) Replace the fuse with same type and same rating fuse.



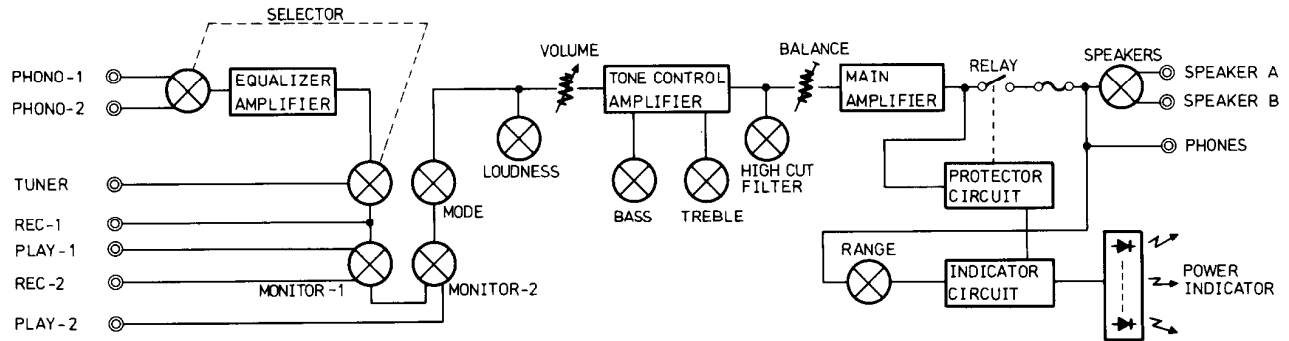
## PRECAUTIONS

1. For continued protection against fire hazard, replace only with same type and same rating fuse.

|                         |           |                         |
|-------------------------|-----------|-------------------------|
|                         |           | <b>PARTS NO.</b>        |
| AC fuse                 | 4A (ST-6) | 252053 (110/120V model) |
|                         | 3A-T      | 252020 (220/240V model) |
| Speaker protection fuse | 4A-T      | 252014                  |

2. Replacement for power, complementary and driver transistors, if necessary, must be made from the same beta ( $h_{FE}$ ) group as the original type.
3. Always disconnect the chassis from power line when soldering.  
Turning the power switch OFF is not enough.  
Power line leakage passing through the heating element may destroy the transistors.

## BLOCK DIAGRAM



## CIRCUIT DESCRIPTION

### Servo Operational Amplifier

In order to achieve a greater degree of fidelity in waveform transmission, and to remove the large capacitance capacitors (which have questionable effect on the quality of sound) from the NFB, DC amplifier designs are being more and more widely used in amplifiers today. The A-7040, however, has advanced even further by adopting the recently developed Servo Operational Amplifier which features a truly superb quality of sound, and performs considerably better than the now conventional DC amplifiers.

The major circuit feature of the Servo Operational Amplifier (see outline in Fig. 1-1) is the servo feedback loop which has no effect whatsoever on the main signal. In other words, if the signal feedback factor is  $\beta_1$ , and the servo feedback factor  $\beta_2$ , the  $0 \leq \beta_2 \leq \beta_1 \leq 1$  relation holds true within the signal bandwidth, while  $\beta_2 \gg 1$  holds true in the subsonic region down to DC. For this purpose, a servo feedback amplifier was necessary. And since it was also necessary to include a high-cut filter, and suppress signal amplifier drift at higher DC gain plus  $1/f$  noise and other subsonic region components, a  $-6\text{dB/oct}$  high-cut mirror integrating circuit (see Fig. 1-2) has been employed. The  $V_{\text{ref}}$  in Fig. 1-1 serves as the input voltage required to keep the system output DC voltage at 0V.

In the block diagram for the actual Servo Operational Amplifier (see Fig. 1-3),  $R_f$  and  $R_B$  constitute the signal feedback loop, while A2 and A3 form the servo feedback loop.

Assuming that  $A_1, A_2, A_3 \gg 1$ , the input/output characteristics  $T(\omega)$  may be expressed as,

$$T(\omega) = \frac{R_N (R_f + R_B)}{A_2 \cdot R_f \cdot R_B} \left[ \frac{1 + \frac{j\omega}{\omega_1}}{1 + \frac{j\omega}{\omega_2}} \right]$$

$$\text{where } \omega_0 = \frac{1}{CR}, \quad \omega_1 = \frac{\omega_0}{A_2}, \quad \omega_2 = \frac{R_F}{R_N} \omega_0.$$

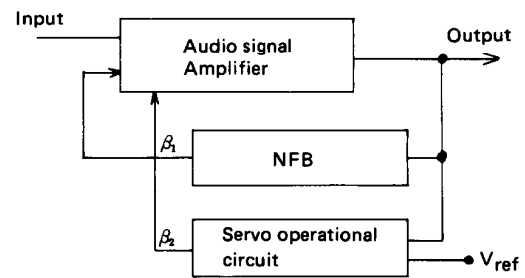


Fig. 1.1

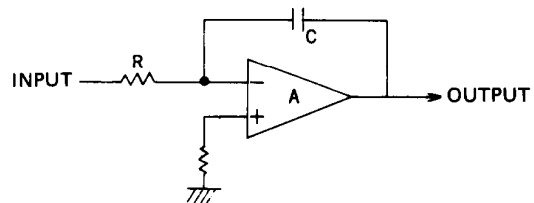


Fig. 1.2

The frequency response is as shown in Fig. 1-4,  $\omega_2$  being about 0.3Hz ~ 2Hz. A3 is phase inverted in order to prevent positive feedback in the DC region.

Hence, the subsonic frequencies are effectively cut just as if by coupling capacitor. But unlike capacitors, the output impedance of the servo operational amplifier decreases at lower frequencies (coupling capacitor impedance increases at corresponding frequencies) due to a greater amount of feedback. Since, however, in actual circuits the second stage is driven at a suitable impedance level, and the output impedance of the amplifier itself is made sufficiently large enough (to improve stability) by connecting a resistance  $\gamma_0$  in series, the output impedance is kept constant at  $\gamma_0$ . With coupling capacitors, on the other hand, the increased impedance at lower frequencies naturally results in an increase in thermal noise (directly related to effective impedance) in the low frequency region.

Although servo feedback circuit integrating capacitors of large leakage current, or high DC resistance and inductance are undesirable, the effects are nowhere near as serious as the insertion of a capacitor in the signal path.

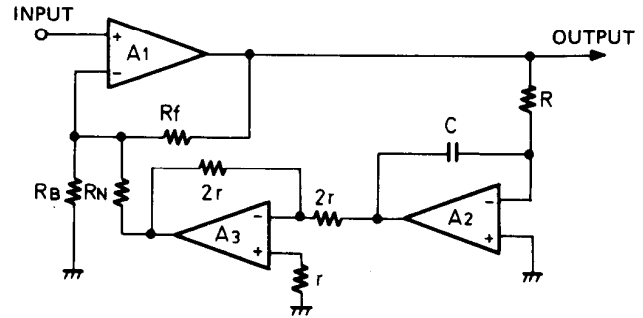


Fig 1.3

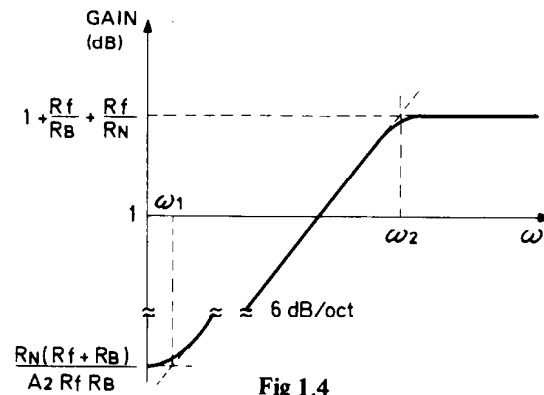
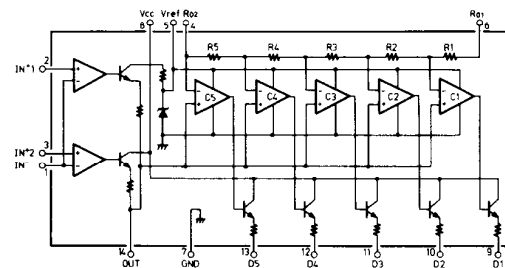


Fig 1.4

### Output Indicator Driver Circuit

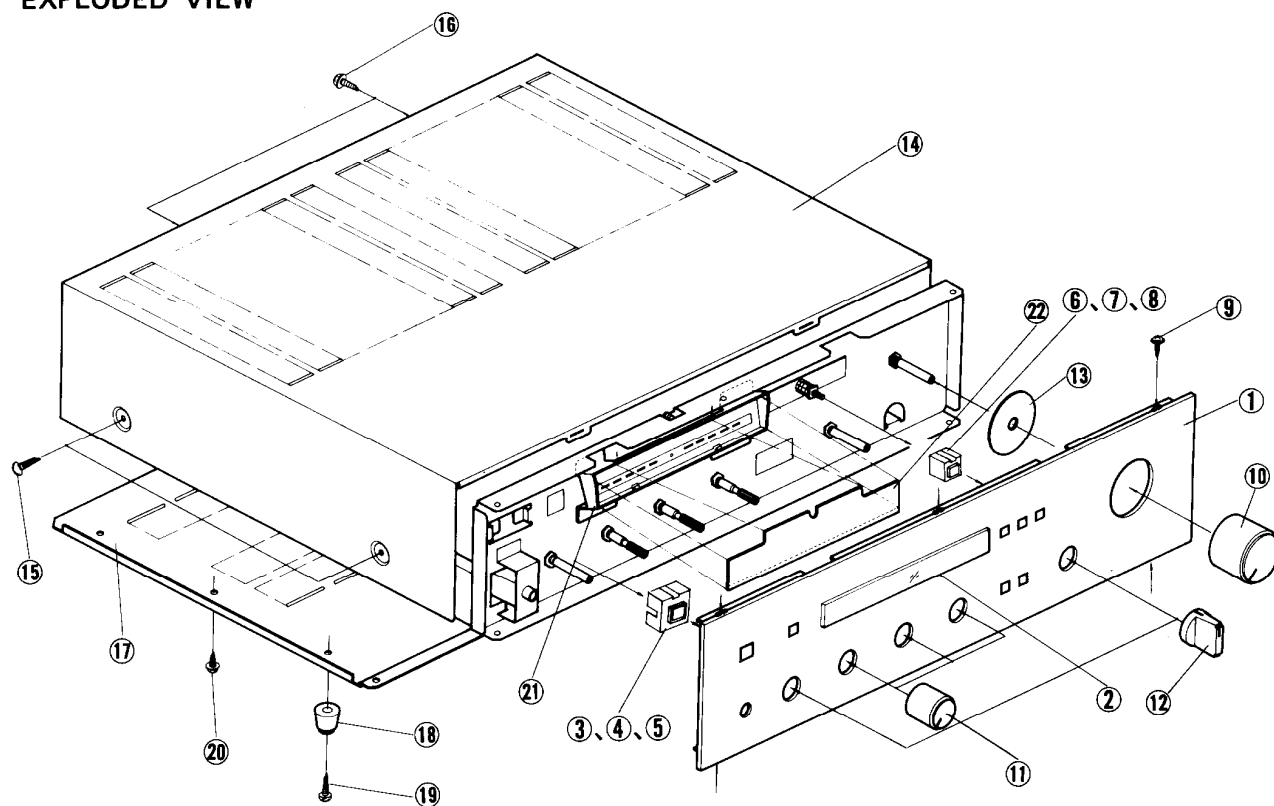
Q701 and Q702 are the power indicator drive ICs. The audio signal applied to pin no. 3 of Q701 is first amplified and then applied to the comparator. The LEDs connected to the IC output terminals pin nos. 9 ~ 13 are lit up in succession depending on the comparator level.

The connection from pin no. 14 to pin no. 1 in Q701 is part of a feedback loop where the feedback resistor R721 (82kΩ) determines the gain of the amplifier, and is consequently used in the adjustment of indicator level.

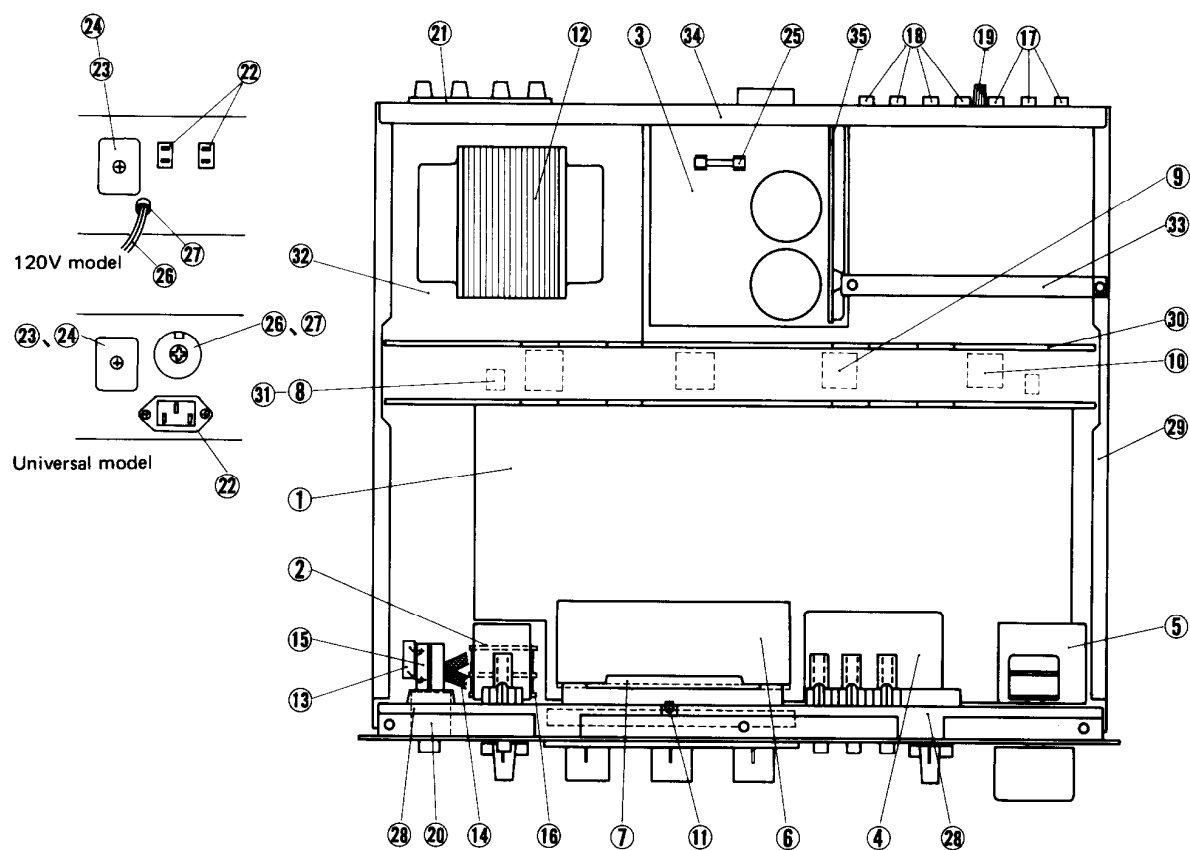


LB1416 EQUIVALENT DIAGRAM

## EXPLODED VIEW



## COMPONENT LOCATION



## EXPLODED VIEW — PARTS LIST

| REF. NO. | PARTS NO. | DESCRIPTION                   | REF. NO. | PARTS NO. | DESCRIPTION                 |
|----------|-----------|-------------------------------|----------|-----------|-----------------------------|
|          | 12669121  | Front panel ass'y (1, 2)      | 11       | 28320312  | Tone control knob           |
| 1        | 27210122  | Front panel                   | 12       | 28320314  | Selector knob               |
| 2        | 28191037  | Glass for indicator           | 13       | 28140126  | Cushion                     |
|          | 13639126  | Power switch knob ass'y (3-5) | 14       | 28184051  | Top cover                   |
| 3        | 27267048A | Power switch guide            |          | 28140020  | Cushion                     |
| 4        | 27180038  | Spring                        | 15       | 838440109 | 4TTB+10C(BC), Tap screw     |
| 5        | 28320319  | Power switch knob             | 16       | 834430062 | 3STS+6BQ(BC), Tapping screw |
|          | 13639125  | Push switch knob ass'y (6-8)  | 17       | 27170054  | Bottom board                |
| 6        | 27267049A | Push switch guide             | 18       | 27175009  | Leg                         |
| 7        | 27180037  | Spring                        | 19       | 831130162 | 3STW+16BQ, Tapping screw    |
| 8        | 28320318  | Push switch knob              | 20       | 831130082 | 3STW+8BQ, Tapping screw     |
| 9        | 834130062 | 3STS+6BQ, Tapping screw       | 21       | 27190044A | Holder                      |
| 10       | 28320308  | Volume control knob           | 22       | 28130073  | Plate, indicator            |

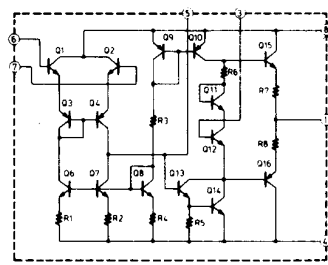
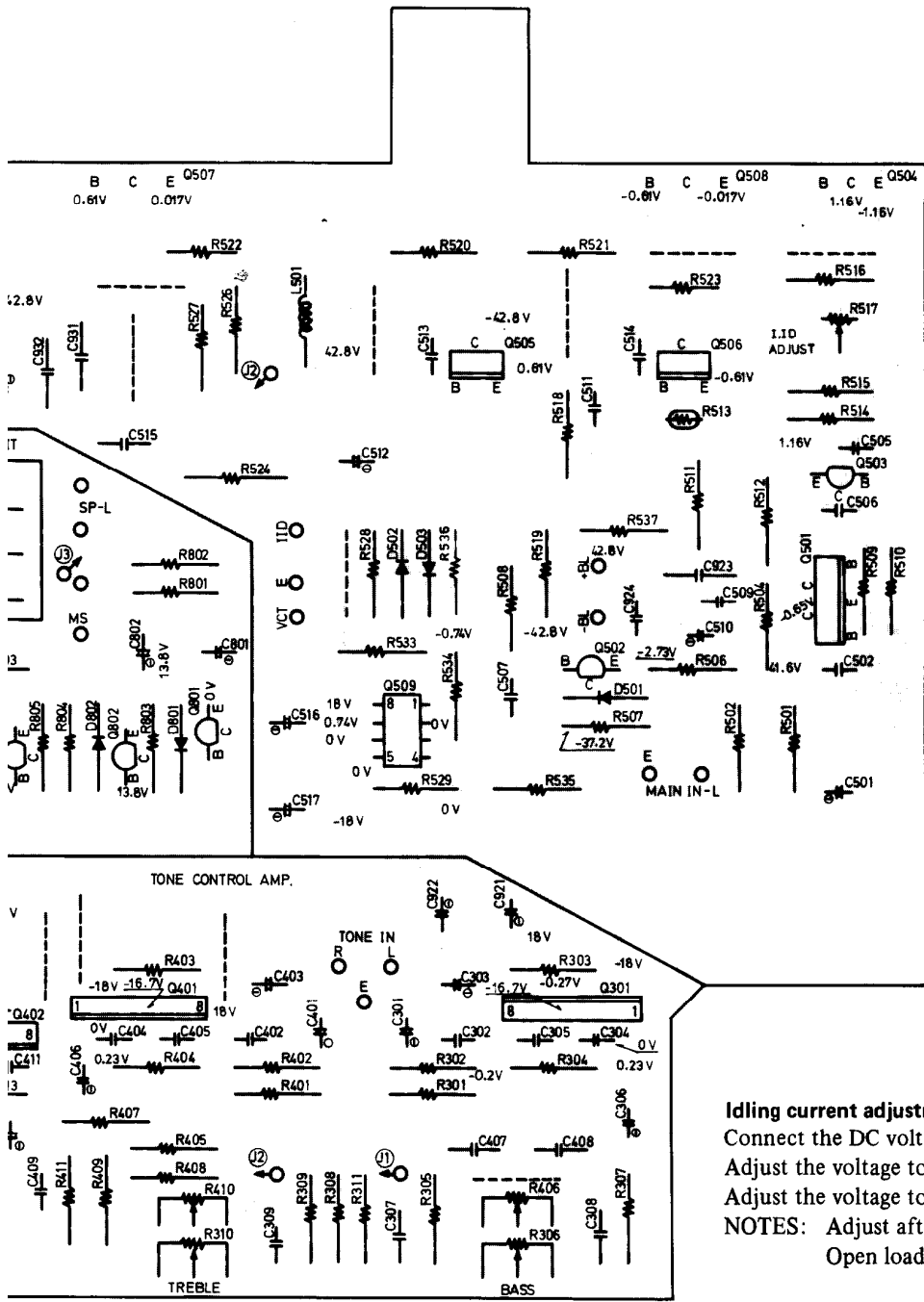
## COMPONENT LOCATION — PARTS LIST

### 120V model

| REF. NO. | CIRCUIT NO.  | PARTS NO.            | DESCRIPTION                                            |
|----------|--------------|----------------------|--------------------------------------------------------|
| 1        |              | 12669540             | NAAF-640, Pre., and main ampli. p.c.b.                 |
| 2        |              | 12669541             | NASW-641, Switch p.c.b.                                |
| 3        |              | 12669542             | NAPS-642, Power supply p.c.b.                          |
| 4        |              | 12669543             | NASW-643, Switch p.c.b.                                |
| 5        |              | 12669544             | NAVR-644, Volume control p.c.b.                        |
| 6        |              | 12669545             | NAME-645, Output indicator driver p.c.b.               |
| 7        |              | 12669546             | NADIS-646, Output indicator p.c.b.                     |
| 8        | Q504, Q604   | 2211255 or 2211256   | 2SC1815(GR) or Thermo ampli. transistor                |
| 9        | Q507, Q607   | 2200993 or 2200994   | 2SC2580(O) or Power ampli. transistor                  |
| 10       | Q508, Q608   | 2201003 or 2201004   | 2SA1105(O) or Power ampli. transistor                  |
| 11       | PL001        | 210057               | PL6.3V 0.15AW1.5, Power indicator lamp                 |
| 12       | T001         | 230286               | NPT-668D, Power transformer                            |
| 13       | C001         | 3504012              | UL125V103M, UL capacitor                               |
| 14       | R001, R002   | 441723314            | 330Ω, 2W, Metal oxide film resistor                    |
| 15       | S001         | 25035135 or 24035138 | NPS-111-L100P or Power selector switch                 |
| 16       | S002         | 25030124             | NRSM-244-35Y, Speaker selector switch                  |
| 17       | P001         | 25045056             | NPJ-6PRBL29, Tuner, Phono 1 and Phono 2 input terminal |
| 18       | P002, P003   | 25045025             | NPJ-4PRBL03, Tape input/output terminal                |
| 19       | P004         | 25060008             | Ground terminal                                        |
| 20       | P005         | 25045018             | LT-100H, Headphone jack                                |
| 21       | P006, P007   | 25060029             | NTM-4PRMN05, Speaker terminal                          |
| 22       | P008, P009   | 25050032             | S-I6444-01, AC outlet                                  |
| 23       | P010, P011   | 25050004             | Fuseholder                                             |
| 24       | P010a, P011a | 252014               | 4A-T, Speaker fuse                                     |
| 25       | F901b        | 252049               | 4A (ST-6), AC fuse                                     |
| 26       | W001         | 253099               | AS-VC-3, Power supply cord                             |
| 27       | W001a        | 270025               | SR-3P-4, Strainrelief                                  |
| 28       | A001         | 27110079             | Front bracket                                          |
| 29       | A014         | 27115043A            | Side bracket                                           |
| 30       | A015         | 27160052             | Radiator                                               |
| 31       | A016         | 223012               | RH-14, Bracket                                         |
| 32       | A017         | 27130148             | Bracket for power transformer                          |
| 33       | A027         | 27140285             | Bracket                                                |
| 34       | A032         | 27120157             | Back panel                                             |
| 35       | A033         | 27150096B            | Shielded plate for equalizer                           |

### Universal model

| REF. NO. | CIRCUIT NO.  | PARTS NO.          | DESCRIPTION                                            |
|----------|--------------|--------------------|--------------------------------------------------------|
| 1        |              | 12669540           | NAAF-640, Pre., and main ampli. p.c.b.                 |
| 2        |              | 12669541           | NASW-641, Switch p.c.b.                                |
| 3        |              | 12670542A          | NAPS-642a, Power supply p.c.b.                         |
| 4        |              | 12669543           | NASW-643, Switch p.c.b.                                |
| 5        |              | 12669544           | NAVR-644, Volume control p.c.b.                        |
| 6        |              | 12669545           | NAME-645, Output indicator driver p.c.b.               |
| 7        |              | 12669546           | NADIS-646, Output indicator p.c.b.                     |
| 8        | Q504, Q604   | 2211255 or 2211256 | 2SC1815(GR) or Thermo ampli. transistor                |
| 9        | Q507, Q607   | 2200993 or 2200994 | 2SC2580(O) or Power ampli. transistor                  |
| 10       | Q508, Q608   | 2201003 or 2201004 | 2SA1105(O) or Power ampli. transistor                  |
| 11       | PL001        | 210057             | PL6.3V 0.15AW1.5, Power indicator lamp                 |
| 12       | T001         | 230287             | NPT-668ADGQ, Power transformer                         |
| 13       | C001, C002   | 3500052            | PME271Y510CEE, IS capacitor                            |
| 14       | R001, R002   | 441723314          | 330Ω, 2W, Metal oxide film resistor                    |
| 15       | S001         | 25035051           | NPS-121-L26P Power switch                              |
| 16       | S002         | 25030124           | NRSM-244-35Y, Speaker selector switch                  |
| 17       | P001         | 25045056           | NPJ-6PRBL29, Tuner, Phono 1 and Phono 2 input terminal |
| 18       | P002, P003   | 25045025           | NPJ-4PRBL03, Tape input/output terminal                |
| 19       | P004         | 25060008           | Ground terminal                                        |
| 20       | P005         | 25045018           | LT-100H, Headphone jack                                |
| 21       | P006, P007   | 25060029           | NTM-4PRMN05, Speaker terminal                          |
| 22       |              | 25050018           | PA-125, 3P inlet                                       |
| 23       | P010a, P011a | 25050004           | Fuseholder                                             |
| 24       | P010, P011   | 252014             | 4A-T, Speaker fuse                                     |
| 25       | F901b        | 252049             | 4A (ST-6), AC fuse                                     |
| 26       | F001a        | 252003             | 3A-T, AC fuse                                          |
| 27       | F001b        | 25050021           | X-I7240, VS socket                                     |
| 28       | A001         | 27110079           | Front bracket                                          |
| 29       | A014         | 27115043A          | Side bracket                                           |
| 30       | A015         | 27160052           | Radiator                                               |
| 31       | A016         | 223012             | RH-14, Bracket                                         |
| 32       | A017         | 27130148           | Bracket for power transformer                          |
| 33       | A027         | 27140285           | Bracket                                                |
| 34       | A032         | 27120158           | Back panel                                             |
| 35       | A033         | 27150096B          | Shielded plate for equalizer                           |



### Idling current adjustment

Connect the DC voltmeter between  $I_{ID}$  and  $V_{CT}$  terminal.

Adjust the voltage to 18mV with R517. (Lch)

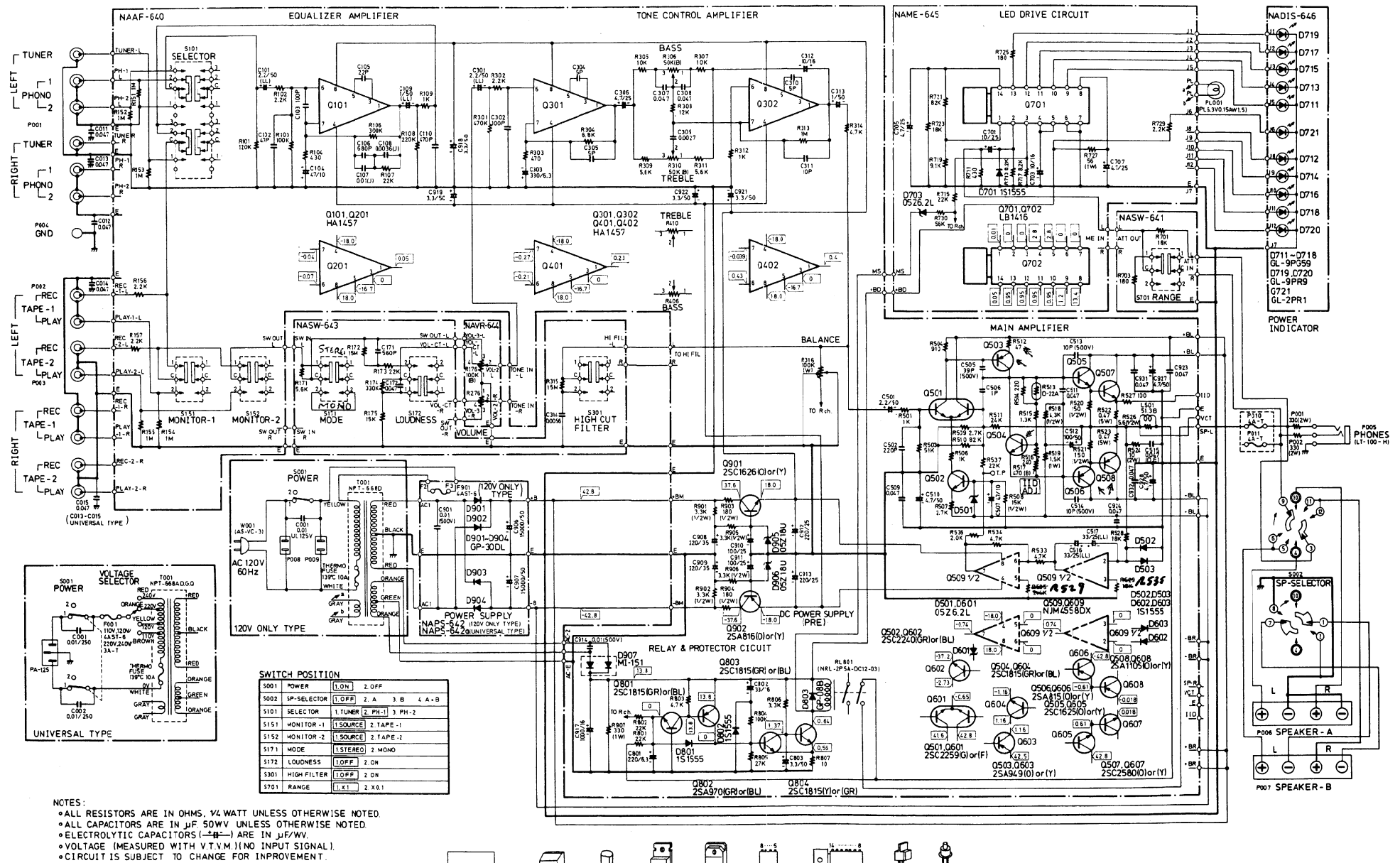
Adjust the voltage to 18mV with R617. (Rch)

**NOTES:** Adjust after switching on for 5 minutes.

Open load, Volume . . . . . Minimum.

# SCHEMATIC DIAGRAM

Model A-7040



ONKYO CORPORATION

# PRINTED CIRCUIT BOARD — PARTS LIST

## PRE., AND POWER AMPLI. PC BOARD (NAAF-640) — PARTS LIST

| CIRCUIT NO.                       | PARTS NO.             | DESCRIPTION                      |
|-----------------------------------|-----------------------|----------------------------------|
| <b>ICs</b>                        |                       |                                  |
| Q101,Q201,Q301,<br>Q302,Q401,Q402 | 222471                | HA-1457                          |
| Q509,Q609                         | 222502                | NJM-4558DX                       |
| <b>Transistors</b>                |                       |                                  |
| Q501,Q601                         | 2211372 or<br>2211371 | 2SC2259(G) or<br>2SC2259(F)      |
| Q502,Q602                         | 2211405 or<br>2211406 | 2SC2240(GR) or<br>2SC2240(BL)    |
| Q503,Q603                         | 2211353 or<br>2211354 | 2SA949(O) or<br>2SA949(Y)        |
| Q504,Q604                         | 2211255 or<br>2211256 | 2SC1815(GR) or<br>2SC1815(BL)    |
| Q505,Q605                         | 2200393 or<br>2200394 | 2SC1625(O) or<br>2SC1625(Y)      |
| Q506,Q606                         | 2200403 or<br>2200404 | 2SA815(O) or<br>2SA815(Y)        |
| Q507,Q607                         | 2200993 or<br>2200994 | 2SC2580(O) or<br>2SC2580(Y)      |
| Q508,Q608                         | 2201003 or<br>2201004 | 2SA1105(O) or<br>2SA1105(Y)      |
| Q801,Q803                         | 2211255 or<br>2211256 | 2SC1815(GR) or<br>2SC1815(BL)    |
| Q802                              | 2211395 or<br>2211396 | 2SA970(GR) or<br>2SA970(BL)      |
| Q804                              | 2211254 or<br>2211255 | 2SC1815(Y) or<br>2SC1815(GR)     |
| Q901                              | 2200663 or<br>2200664 | 2SC1626(O) or<br>2SC1626(Y)      |
| Q902                              | 2200673 or<br>2200674 | 2SA816(O) or<br>2SA816(Y)        |
| <b>Diodes</b>                     |                       |                                  |
| D501,D601                         | 224042                | 05Z6.2L                          |
| D502,D503,D602<br>D603,D801,D802  | 223105                | 1S1555                           |
| D803                              | 223848                | GP-08B                           |
| D905,D906                         | 224065                | 05Z18U                           |
| D907                              | 223853                | MI-151                           |
| <b>Coils</b>                      |                       |                                  |
| L501,L601                         | 231001                | S-1.3B                           |
| <b>Capacitors</b>                 |                       |                                  |
| C101,C201                         | 392880227             | 2.2 $\mu$ F, 50V, LL             |
| C104,C204                         | 352734701             | 47 $\mu$ F, 10V, Elect.          |
| C109,C209                         | 392880107             | 1 $\mu$ F, 50V, LL               |
| C301,C401                         | 392880227             | 2.2 $\mu$ F, 50V, LL             |
| C303,C403                         | 352723311             | 330 $\mu$ F, 6.3V, Elect.        |
| C306,C406                         | 352750471             | 4.7 $\mu$ F, 25V, Elect.         |
| C312,C412                         | 352741001             | 10 $\mu$ F, 16V, Elect.          |
| C313,C413                         | 352780101             | 1 $\mu$ F, 50V, Elect.           |
| C501,C601                         | 352780221             | 2.2 $\mu$ F, 50V, Elect.         |
| C507,C607                         | 352734701             | 47 $\mu$ F, 10V, Elect.          |
| C510,C610                         | 352780471             | 4.7 $\mu$ F, 50V, Elect.         |
| C512,C612                         | 352781011             | 100 $\mu$ F, 50V, Elect.         |
| C513,C514<br>C613,C614            | 345071002             | 10pF $\pm$ 2%, 500V, Ceramic     |
| C515,C615                         | 374124735             | 0.047 $\mu$ F $\pm$ 10%, 50V, DE |
| C516,C517<br>C616,C617            | 392853307             | 33 $\mu$ F, 25V, LL              |
| C801                              | 352722211             | 220 $\mu$ F, 6.3V, Elect.        |
| C802                              | 322743301             | 33 $\mu$ F, 16V, Elect.          |
| C803                              | 352780331             | 3.3 $\mu$ F, 50V, Elect.         |
| C908,C909                         | 352762211             | 220 $\mu$ F, 35V, Elect.         |
| C910,C911                         | 352751011             | 100 $\mu$ F, 25V, Elect.         |
| C912,C913                         | 352752211             | 220 $\mu$ F, 25V, Elect.         |
| C917                              | 352741021             | 1,000 $\mu$ F, 16V, Elect.       |
| C918—C922                         | 352780331             | 3.3 $\mu$ F, 50V, Elect.         |
| C927—C930                         | 352780471             | 4.7 $\mu$ F, 50V, Elect.         |

**CAUTION:** Replacement for power, complementary and driver transistors, if necessary, must be made from the same beta group ( $h_{FE}$ ) as the original type.

**NOTES:** Capacitors: LL: Low leakage current type electrolytic capacitor

DE: Non-inductive polyester film capacitor

Resistors: MOF: Metal oxide film resistor

| CIRCUIT NO.            | PARTS NO. | DESCRIPTION                     |
|------------------------|-----------|---------------------------------|
| <b>Resistors</b>       |           |                                 |
| R306,R406              | 5148035   | N16RGM11C50KBS35                |
| R310,R410              | 5148034   | N16RGM11C50KBO35                |
| R316                   | 5104079   | N16RLC100KWTP35                 |
| R508,R608              | 441521534 | 15k $\Omega$ , 1/2W, M.O.F.     |
| R513,R613              | 4000003   | D-22A, Thermistor               |
| R517,R617              | 5225026   | N10HR470BD,                     |
| R158,R618              | 441524324 | 4.3k $\Omega$ , 1/2W, M.O.F.    |
| R519,R619              | 441621524 | 1.5k $\Omega$ , 1W, M.O.F.      |
| R520,R521<br>R620,R621 | 441521514 | 150 $\Omega$ , 1/2W, M.O.F.     |
| R522,R523<br>R622,R623 | 4000047   | 0.47 $\Omega$ , 5W, Metal plate |
| R524,R624              | 451731004 | 10 $\Omega$ , 2W, Metal         |
| R526,R626              | 451630564 | 5.6 $\Omega$ , 1W, Metal        |
| R903,R904              | 441521814 | 180 $\Omega$ , 1/2W, M.O.F.     |
| R907                   | 441623314 | 330 $\Omega$ , 1W, M.O.F.       |
| <b>Switches</b>        |           |                                 |
| S101                   | 25030127  | NRSM-143-35ZR                   |
| S151,S152              | 25035115  | NPS-222-L80                     |
| <b>Relay</b>           |           |                                 |
| RL801                  | 25065085A | NRL-2P-5A-DC12-03               |

## SWITCH PC BOARD (NASW-641) — PARTS LIST

|      |          |             |
|------|----------|-------------|
| S701 | 25035109 | NPS-122-L74 |
|------|----------|-------------|

## POWER SUPPLY PC BOARD (NAPS-642) — PARTS LIST (120V model)

|           |         |                                       |
|-----------|---------|---------------------------------------|
| D901—D904 | 223863  | GP-30DL, Diode                        |
| C906,C907 | 3504118 | 15,000 $\mu$ F, 50V, Elect. capacitor |
| F901a     | 250113  | SN5051, Fuseholder                    |

## POWER SUPPLY PC BOARD (NAPS-642a) — PARTS LIST (Universal model)

|           |         |                             |
|-----------|---------|-----------------------------|
| D901-D904 | 223863  | GP-30DL, Silicon diode      |
| C906,C907 | 3504118 | 15,000 $\mu$ F, 50V, Elect. |

## SWITCH PC BOARD (NASW-643) — PARTS LIST

|                |          |             |
|----------------|----------|-------------|
| S171,S172,S301 | 25035114 | NPS-322-L79 |
|----------------|----------|-------------|

## VOLUME CONTROL PC BOARD (NAVR-644) — PARTS LIST

|           |         |                                        |
|-----------|---------|----------------------------------------|
| R176,R276 | 5172055 | N24RGL41C100KBTP35M,<br>Volume control |
|-----------|---------|----------------------------------------|

## METER DRIVER PC BOARD (NAME-645) — PARTS LIST

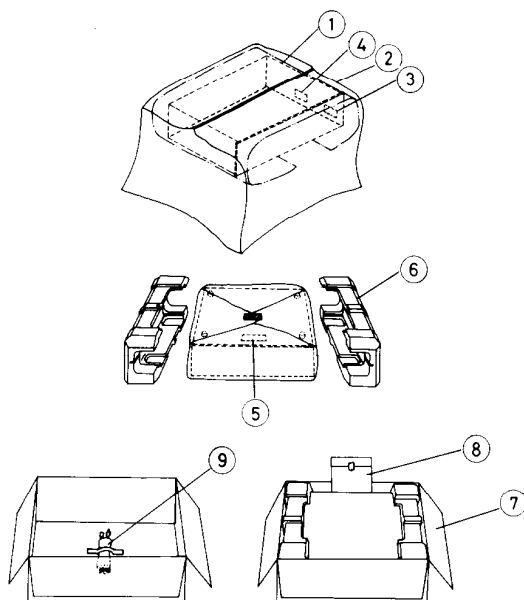
|            |           |                          |
|------------|-----------|--------------------------|
| Q701, Q702 | 222539    | LB1416, IC               |
| D701,D702  | 223105    | 1S1555, Silicon diode    |
| D703       | 224042    | 05Z6.2L                  |
| C701,C702  | 352751001 | 10 $\mu$ F, 25V, Elect.  |
| C703,C704  | 352741001 | 10 $\mu$ F, 16V, Elect.  |
| C705—C708  | 352750471 | 4.7 $\mu$ F, 25V, Elect. |

|                  |           |                          |
|------------------|-----------|--------------------------|
| <b>Resistors</b> |           |                          |
| R727,R728        | 441625604 | 56 $\Omega$ , 1W, M.O.F. |

## DISPLAY PC BOARD (NADIS-646) — PARTS LIST

|           |        |                  |
|-----------|--------|------------------|
| D711—D718 | 225028 | GL-9PG59, L.E.D. |
| D719,D720 | 225029 | GL-9PR9, L.E.D.  |
| D721      | 225018 | GL-2PR1, L.E.D.  |

## PACKING PROCEDURES



| REF. NO. | PARTS NO.       | DESCRIPTION                     |
|----------|-----------------|---------------------------------|
| 1        | 29100036        | 850 x 550mm, Poly bag           |
| 2        | 29095012        | 500 x 800mm, Protection sheet   |
| 3        | 29380040        | Cabinet composite label (USA)   |
| 4        | 282969          | Caution label (A) (USA)         |
| 5        | 293041          | Caution label (USA)             |
| 6        | 29090398        | Pad                             |
| 7        | 29050269        | Carton box                      |
| 8        |                 | Accessory bag complete          |
|          | U.S.A. model    |                                 |
|          | 29340315        | Instruction manual              |
|          | 29365006        | Warranty card                   |
|          | 29358002        | S. S list                       |
|          | 29100006        | 250 x 350mm, Poly bag           |
|          | Universal model |                                 |
|          | 29340316        | Instruction manual              |
|          | 25055018        | Conversion plug                 |
|          | 252049          | 4A ST-6, Fuse                   |
|          | 29100002        | 150 x 80 mm, Poly bag for fuse  |
|          | 29100006        | 250 x 350mm, Poly bag           |
|          | Germany model   |                                 |
|          | 29340316        | Instruction manual              |
|          | 29365005-1      | Warranty card                   |
|          | 29100006        | 250 x 350mm, Poly bag           |
| 9        | 13710703        | Power supply cord (UU)          |
|          | 253089          | AS-VDE-C, Power supply cord (G) |
|          | 29380038        | Voltage tag (UU), (G)           |
| NOTE:    | (USA):          | U.S.A. model                    |
|          | (UU):           | Universal model                 |
|          | (G):            | Germany model                   |

**ONKYO CORPORATION**

International Division: No. 24 Mori Bldg., 23-5, 3-chome, Nishi-Shinbashi, Minato-ku, Tokyo, Japan  
 Telex: 2423551 ONKYO J. Phone: 03-432-6981

**ONKYO U.S.A. CORPORATION**

Eastern Office  
 42-07 20th Avenue, Long Island City, New York 11105, U.S.A. Phone: (212) 728-4639  
 Midwest Office  
 935 Sivert Drive, Wooddale, Illinois 60191, U.S.A. Phone: (312) 595-2970

**ONKYO DEUTSCHLAND GMBH, ELECTRONICS**

8034 München-Germering, Industriestrasse 18, West Germany. Telex: 521726 Telefon: (089)-84-5041